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ABSTRACT

Black and Hispanic students are more likely to exercise public school choice. Previous large-scale quantitative studies have ignored ethnic distinctions as well as choice's multidimensional nature. As a result, the effects of public sector choice policy on the academic achievement of minority students are unknown. This study uses data from the National Educational Longitudinal Study of 1988 in a structural equation model to test and compare the effects of school choice on the academic achievement of 853 Black and Hispanic high school students. It is concluded that school choice has no indirect effect on academic achievement. Other findings include: (1) a student's socioeconomic status predicts choice; (2) school choice positively influences a sense of belonging and support; (3) school choice's influence on student effort is indirectly transmitted via an enhanced sense of belonging and support; and (4) choosing does not increase the likelihood that students will enroll in an academically rigorous program. (Contains 5 tables, 6 figures, and 109 references.) (Author/SLD)

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The Effects of Public School Choice on the Academic Achievement of Minority Students

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Abstract

Black and Hispanic students are more likely to exercise public school choice. Previous large-scale quantitative studies have ignored ethnic distinctions as well as choice's multi-dimensional nature. As a result, the effects of public sector choice policy on the academic achievement of minority students are unknown. This study uses data from the National Educational Longitudinal Study of 1988 in a structural equation model to test and compare the effects of school choice on the academic achievement of 853 Black and Hispanic high school students. The authors conclude that school choice has no indirect effect on academic achievement. Other findings include; a student's socioeconomic status predicts choice, school choice positively influences a sense of belonging and support, and school choice's influence on student effort is indirectly transmitted via an enhanced sense of belonging and support. Finally, choosing does not increase the likelihood students will enroll in an academically rigorous program.

The Effects of Public School Choice on the Academic Achievement of Minority Students

Historically, minorities in the United States have attended some of the poorest schools in the nation, and their academic performance reflects this injustice. Of all groups, Blacks and Hispanics have the least to lose and the most to gain in the school choice debate. This study tests the indirect effect of public school choice policy on the academic achievement of Black and Hispanic high school students through a complex of interrelationships using structural equation modeling. To date, no nationally representative study has attempted to investigate this relationship.

Some form of school choice has been endorsed by the past three presidential administrations. During the last presidential campaign both parties advocated for some form of choice. Bob Dole, the Republican presidential challenger, offered cash scholarships to low- and middle-income students (Associated Press, 1996). President Clinton favors a more mainstream approach, limiting school choice to the public sector in the form of charter schools (Clinton/Gore '96 Campaign, 1996). The popular press abounds with similar articles about school choice. Given this reform's popularity with the voting public, it's little wonder why politicians are leading the crusade for school choice.

The scope of public school choice plans includes: town tuitioning, voluntary transfers, magnet schools, and charter schools (Cookson, 1994; Maddaus, 1990). Almost every state in the nation offers some form of school choice. At least 16 states permit some type of statewide public school choice, while another 13 offer intra-district public school choice. Eleven permit autonomous public charter schools (Center for

Education Reform, 1996a). Magnet schools continue to remain popular. In March 1996, Florida experienced a 25% increase in magnet school applications (Center for Education Reform, 1996b). In fact, President Clinton's 1998 budget proposal included $100 million dollars to expand public school choice (U. S. Dept. of Education, 1997).

Skeptics caution that public school choice will harm children who remain behind. Because state aid is generally deducted on a per-pupil basis, when a child leaves a school district remaining children, whose parents do not choose, may be penalized indirectly with reduced or eliminated programs because of declining revenues (Fowler-Finn, 1993). It is also argued that parents do not always choose schools because they are concerned about the quality of education. Parents may simply be dissatisfied with their child's present school (Goldring & Hausman, 1996). On the other hand, convenience may drive their decision to choose. Child care and work location may significantly influence a parent's decision to opt for school choice (Boyer, 1992). In other cases, parents sometimes choose schools that are located in communities with higher median incomes and better standardized test scores than their home communities (Fossy, 1994; Maddaus & Marion, 1995).

Maddaus (1990) notes, in his review of the literature, that conservatives and liberals alike endorse public school choice *and* equitable educational programs. Equal educational opportunities for all children are a commonly held myth. Since 1981 African-American and Hispanic children have constituted the majority of public school students in central cities such as Chicago, New York, and Los Angeles (U.S. Dept. of Education, 1995b). Typically, schools in these cities are more affected by economic and social problems than their suburban or rural counterparts.

Black and Hispanic students trail White students in all measures of academic performance. They are less likely to complete four years of college (National Center for Education Statistics, 1994; U. S. Dept. of Education, 1995; Kim & Hocevar, 1996). Minorities are also less likely to take college prep courses in high school. When they do, their grades are not as high as Whites (Noble, 1996). Finally, both Hispanics and Blacks have higher dropout rates than Whites or Asians (National Center for Educational Statistics, 1993). Low academic performance contributes, in a large part, to lower levels of employment and earnings for these groups.

Historically, minorities have been relegated to some of the nation's most decrepit schools. Naturally, these groups are more likely to exercise choice (Schneider, Schiller, & Coleman, 1996). A recent poll of 1,003 individuals found 84% of surveyed Blacks supporting school choice (Center for Education Reform, 1997). Minorities have the least to lose and the most to gain in the school choice debate.

To date, no nationally representative study has attempted to investigate the relationship between public school choice and minority achievement. Despite a lack of clear empirical evidence using a nationally representative sample, there still are theoretical and empirical reasons to believe that public school choice policy might, in a positive way, indirectly influence the educational performance of minority students across the nation.

Alum Rock's disappointing experience with a controlled experimental research design is not surprising (Capell, 1981). It is very difficult to conduct this type of research in schools, especially public schools. Political forces can cause an experimental design to become irreparably corrupted. That is precisely what happened at Alum Rock. The

program's initial ground rules for parent choice were changed several times because of local political opposition (Cohen & Farrar, 1977). The lack of positive evidence from Alum Rock is more likely attributed to factors unrelated to parental choice.

Proponents often cite the remarkable gains made by poor inner-city students in Community District 4, East Harlem, New York City. Average district-wide reading achievement has risen steadily since the program's inception as reported by Domanico (1989) and Fliegel (1990). However, these authors fail to point out that increases in District 4 coincided with increases experienced in public schools city-wide. In this instance, achievement gains may be falsely associated with school choice policy.

Qualitative studies such as Blank, Dentler, Baltzell, and Chabotar (1983) help to inform us about the multifaceted aspects of choice. Their work is excellent because it uses data from a wide number of sources. Program evaluation studies such as Beales and Wahl (1995); Lee, Coladarci, and Donaldson (1996); Martinez, Godwin, and Kemerer (1996); or Witte, Thorn, Pritchard, and Claibourn (1994) again serve to provide insight into specialized initiatives. However, as Clune (1990) aptly points out, generalization is a common problem with this type of study. On one hand these studies lack the ability to predict, outside of their venues, the consequences of expanding school choice programs in other settings. Yet, lumping all choice plans together may provide a sample large enough for analysis, with substantial potential for generalization, but it also may obscure important details that really make a difference.

To conclude, what does the extant literature say about school choice and minorities? First, minorities are more likely to exercise school choice. Second, choice

can empower the disenfranchised and disaffected. Finally, choice's relationship to minority academic achievement is yet to be established.

Many minority families, regardless of where they live, favor choice because they see it as a means to access better schools (Lee, Croninger, & Smith, 1996; Schneider, Schiller, & Coleman, 1996). For example, in a study of transfer requests to magnet schools in Maryland's Montgomery County, Henig (1996) found minorities, proportionally, had higher transfer request rates than Whites. Other recent studies bear out similar findings (Blank, Levine, & Steele, 1996; Witte, 1996).

We also know that school choice empowers parents and students. The traditional, rational-bureaucratic school organization generally, has alienated minority students (Newmann, 1990). In a study of high school students in St. Louis, Wells (1991) concludes that parental alienation and powerlessness decreases the likelihood Black students will seek transfer to a suburban school. One's view of the world is influenced by the traditional distribution of power within a society. Beliefs in a lack of genuine opportunities covary with academic performance among Black students (Mickelson, 1990). These students, generally, choose a less demanding program of study which only magnifies the social stratification of educational outcomes (Lee, 1993). However, Ogbu (1982) believes that choice is empowering, resulting in positive perceptions about school. He hopes that, as a result, minority achievement will improve.

Unfortunately, researchers have yet to clearly establish a positive relationship between school choice and student achievement. While most have found no direct relationship, many have uncovered achievement gains resulting from increased effort

(Beales & Wahl, 1995; Greeley, 1982; Hill, 1996; Keith & Page, 1983; Martinez, Godwin, & Kemerer, 1996; Plank, Schiller, Schneider, & Coleman, 1993). Elmore and Fuller (1996) continue to remain unconvinced and they urge policy-makers to continue to seriously investigate the impacts of school choice and the achievement effects for specific groups of students.

If our nation, or even a state, adopts widespread school choice, it is essential to include critical elements that will positively influence academic performance. This requires large-scale research projects that result in generalizable findings. Prior attempts have been made to address this issue. Ex post facto methods dominate the research (Alexander & Pallas, 1985; Chubb & Moe, 1990; Coleman, Hoffer, & Kilgore, 1982; Driscoll, 1993; Gamoran, 1996; Greeley, 1982; Hoffer, Greeley, & Coleman, 1985; Jencks, 1985; Lee & Byrk, 1989; Lee, Coladarci, & Donaldson, 1996; Plank, Schiller, Schneider, & Coleman, 1993; Sosniak & Ethington, 1992; Willms, 1985). The largest share of this list used the High School and Beyond (HSB) national longitudinal data set. Only a few have begun to use HSB's successor, the National Educational Longitudinal Study of 1988 (NELS:88). Though both are nationally representative data sets on high school students, designers have tried to improve NELS:88 based on their HSB experiences. For example, Witte (1992) criticizes school choice studies that employ HSB data because they often rely on student surveys to indirectly measure socio-economic status and parental attitudes. NELS:88, on the other hand, asks parents directly about their SES and attitudes.

Despite such drawbacks, Witte (1992) suggests we have learned a great deal from studies using HSB data that can inform future research on school choice policy. His comments on general findings are included in the following list.

- Achievement gains from 10th to 12th grades are very small, about 0.1 of a standard deviation per year.
- Prior achievement as measured by 10th grade tests is always significant and it has a strong effect on student-level gains.
- Family and student background variables are always significant and have the largest effect when predicting achievement gains at the student level.
- Students enrolled in an academic track, taking more difficult courses, consistently learned more.
- For some studies, school SES, percentage of minorities in school (ethnic diversity), and percentage of students in academic tracks have significant effects on achievement.
- Public vs. private sector effects for achievement are statistically significant but relative size is small when prior achievement is controlled and student background, tracking, and course taking are included.

The extent that future researchers can employ better data such as NELS:88 and account for these findings from HSB in their own studies will determine the overall quality and generalizability of crucial choice policy elements.

Many of Witte's findings regarding weaknesses of prior research of a similar nature have been addressed in NELS:88. The following improvements incorporated into the current study parallel Witte's (1992) list:

- The amount of time students are involved with choice has been doubled from two years to four.
- Scores on eighth grade achievement tests are used to control for prior ability on twelfth grade achievement tests. This places all students on equal academic footing *prior* to entry into high school.

- Rather than relying on student reporting for family background control variables, parent surveys will be used.
- Transcript data will provide an accurate accounting of the influence of curriculum.
- Due to an extensive body of literature on the subject and our own research (Lee, Coladarci, & Donaldson, 1996), it is likely the only relationship between school choice and student performance is an indirect path through several psychological variables.
- Because variation among students is wider within the public and private sectors than is found between the two (Willms & Echols, 1993), analysis will be conducted within sector to maximize detection of any influence of school choice policy on achievement. Prior research comparing pubic to private schools may have failed to detect significant differences because of a lack of variability between sectors.

This list is by no means comprehensive. It is included here only to illustrate how prior studies using large-scale databases have influenced the development of the present investigation.

Method

This study uses structural equation modeling (SEM) to estimate the effects of school choice on academic achievement. SEM relies, in part, on classical path analysis (Duncan, 1966) to model a causal explanation describing how an independent variable influences a dependent variable directly and indirectly through mediating variables. Path analysis makes use of diagrams to graphically present an a priori causal structure among variables. This hypothesized model is built upon theory grounded within the extant literature.

Before we explain the model, a short orientation to the logic underpinning the model may be helpful. Briefly, we posit that Black and Hispanic students choosing their public high school will enjoy a more racially hospitable climate where minority students

get along well with their teachers and other students. That is to say, they "fit in" better. Choosing one's school and enjoying a positive racial climate cause these students, in turn, to exert more academic effort at school and home. Students will report that they pay greater attention in class and complete their homework, sometimes doing more than required. Encouragement as a result of increased academic effort will bolster the student's confidence to enroll in a more academically challenging curriculum. The rigor of their program will be reflected in the difficulty and number of high school courses successfully completed. To summarize, increased academic achievement is realized when a student experiences better racial fit, increases academic effort, and enrolls in a more challenging academic program.

Model's Theory

Figure 1 is the structural model, it describes how school choice influences student achievement among Black and Hispanic students. Let us begin with the independent variable, school choice. We hypothesize the influence of school choice on a student's 1992 achievement will be indirect through its effect on fit, effort, and academic rigor. When Black or Hispanic students choose and are accepted by a public school of choice employing some selective admissions criteria, they will be more likely to benefit from positive student/teacher relationships (Bidwell, 1970; Blank et al., 1983; Fizzell, 1987). Additionally, they will choose to remain in a school that has a favorable racial climate. Minorities tend to opt for schools where they are less likely to be racially isolated (Henig, 1995), and magnet schools seem to advance racial interaction (Blank et al., 1983). Therefore, we hypothesize Black or Hispanic students' fit will be better when

they choose their school; hence we posit a path between school choice and fit. The arrow labeled with the letter H represents this relationship.

Subsequently, fit influences effort because students experience a sense of belonging and support from their teachers (Calabrese, 1990; Coleman, 1988; Kottcamp, 1979; Lee & Byrk, 1989; Murnane, 1984). School choice also influences student effort (Greeley, 1982; Hoffer, Greeley, & Coleman, 1985; Keith & Page, 1983) because students are more committed and motivated in a school they have chosen (Fizzell, 1987; Raywid, 1987a, 1989; Uchitelle, 1993). Therefore, fit and school choice affects subsequent achievement indirectly through effort as depicted by paths J and I. Effort positively influences 1992 achievement (Hartel, Walberg, & Weinstein, 1983; Hernández-Gantes, 1995; Johnson, 1992; Keith & Benson, 1992; Keith & Cool, 1992; Reynolds & Walberg, 1993) path L marks this relationship.

The effect of school choice's influence on achievement isn't limited to the influence of fit and effort; it also will be transmitted indirectly through academic rigor (paths K and M). Earlier, we postulated that school choice sets in motion certain forces that help create a more favorable racial climate and promote positive student/teacher relationships as well as increase a student's motivation or effort levels. The combined power of these variables, fit and effort, will improve minority students' attitudes toward subject matter and increase the likelihood they will enroll in a more demanding curriculum (Hartel et al., 1983; Keith & Cool, 1992; Lee & Byrk, 1988). The positive influence of course selection, academic track, and challenging coursework on student achievement is well established (Gameron, 1987; Keith & Cool, 1992; Lee, 1993; Lee & Byrk, 1988; Witte, 1992).

Prior achievement, as measured by 1988 achievement, will have a powerful influence on 1992 achievement (Adams & Singh, 1996; Haertel et al., 1983; Keith & Benson, 1992; Keith & Cool, 1992; Willms, 1985; Witte, 1992). Chubb and Moe's (1989) school choice study found student aptitude to be the most significant factor influencing achievement gains of high school students. In a similar study Coleman, Hoffer, and Kilgor (1982) compared student achievement in public and Catholic high schools. Using High School and Beyond data, these authors concluded Catholic schools were superior to their public counterparts. This finding produced considerable controversy within educational and political circles, causing many to question the effectiveness of our nation's public schools.

However, Coleman, Hoffer, and Kilgore failed to control for, among other things, ability's influence on student achievement. A subsequent analysis of the same data by Willms (1985) did; reducing Coleman, Hoffer, and Kilgore's claim of a Catholic school advantage from 15 to 20 per-cent of a standard deviation to 5 per-cent.

Because choice policy includes a selective aspect, there is a likelihood high-performing students will be selected for admission over other students (Archibald, 1996; Bridge & Blackman, 1978; Martinez, Kemerer, & Godwin, 1996). Therefore, ability is critical to the credibility of any school choice study. Paths F, E, and G represent these influences.

Note the path between socioeconomic status and 1988 achievement. Here we reason a student's academic achievement is influenced by his parents' educational levels and family income (Wang, Haertel, & Walberg, 1993).

Socioeconomic status (SES) is an exogenous variable[1] included as a statistical control. SES has been linked to school choice (Alexander & Pallas, 1985; Bridge & Blackman, 1978; Chubb & Moe, 1990). Archibald (1996) found parents of higher social strata are more likely to opt for magnet schools and, as a result, are more likely to gain admission. In general, high-income students receive higher-quality educational programs than low-income students (Manski,1994). Taken together, these are compelling reasons to control for SES's influence on school choice, academic rigor, 1988, and 1992 achievement (paths A, B, C and D), particularly because this study involves Black and Hispanic students.

Figure 2 is has the added dimension of the measurement model. It is helpful to know that observed variables are designated by rectangles and their error terms or residuals are depicted by the lowercase "r" within small circles. Latent variables are represented by ellipses. Circles labeled "d" are disturbances, the effects on latent variables of all variables not included in the model. Note some paths are restricted to 1. This makes an observed variable a reference item thus establishing a measurement unit for the latent variable (years to years, pounds to pounds, etc.). NELS:88 variable names are within rectangles. It may be helpful to refer to Table 1 as it contains a complete description of NELS:88 variable names and their associated survey or achievement test items.

NELS:88

Data used to test the model are drawn from the National Education Longitudinal Study of 1988 (NELS:88). Directed by the U.S. Department of Education's National

[1] The term, "exogenous" refers to variables exclusively influenced by factors outside the model.

Center for Education Statistics, the principal objective of NELS:88 is to provide trend data about students as they leave elementary school, progress through high school, and go on to post-secondary education or the labor force. Data about policy-relevant issues, such as learning and school effects, were gathered between 1988 and 1992.

Students included in NELS:88 were selected using a two-stage, stratified sample design, with schools as the first-stage unit and students within selected schools as the second-stage unit. Schools were selected with eighth-grade enrollments that were proportional, on several factors, to eighth-graders nationally to achieve virtual self-weighting. Within each school approximately 26 students were randomly selected to participate. Additionally, some schools were deliberately oversampled, for example, schools with minority enrollments greater than 19 percent. This procedure facilitated identification and stratification of schools with very large percentages of Black or Hispanic students. Oversampling of minority schools and students ensured adequate numbers of students for future studies, such as this.

Between February and June 1988 randomly selected eighth graders gathered to complete a student questionnaire followed by an 85-minute battery of cognitive tests. This procedure was repeated with the same students from January through June 1990, and once again in 1992. At the end of each session data collection personnel reviewed questionnaires for completeness.

The student questionnaire gathered background information and covered a wide range of topics including school, work, educational and occupational aspirations, as well as information on social relationships. The cognitive tests included in NELS:88 provide an acceptable measure of an individual's achievement in several academic areas at a

given point in time, as well as their growth over time -- in particular, academic growth between the eighth, tenth, and twelfth grades. The cognitive test, developed by the Educational Testing Service (ETS), was field tested and modified prior to its first administration in 1988. The test consists of 116 items completed within 85 minutes. It covers four achievement areas: history, mathematics, reading comprehension, and science.

Additionally, students' parents, two of their teachers, and their school administrator were surveyed between 1988 and 1992. A small number of items from the administrator and parent surveys are included in this study.

NELS:88 also includes composites, flags, and weights. Demographic and socioeconomic composites are used to describe students who are flagged as members of all three panels.[2] Data files are designed to be used as weighted data sets in all analyses. In order to ensure the sample is representative of the nation's Black and Hispanic population, a sampling weight was formed by dividing the student's 1992 transcript weight by the sample's mean weight. The quotient resulting from dividing the NELS:88 transcript panel weight[3] by its mean (204.94) is used to weight all cases. Weighting compensates for unequal probabilities of selection and adjusts for the effects of non-response.

Variables

In this section we specify how the model's variables were constructed. Building upon Coleman, Schiller, and Schneider's (1993) work we created the independent

[2] NELS:88 is composed of three data collection points or panels, 1988, 1990, and 1992.
[3] F2TRP1WT allows panel analyses using transcript data in conjunction with 1988, 1990 and 1992 student survey data.

variable, school choice. It is a dummy variable[4] made by winnowing a 1988 nationally representative sample of 24,599 eighth grade students to a small sub-sample of 1,360 Black and Hispanic twelfth graders (Class of 1992) who meet very restrictive criteria reflecting a highly orthodox view of school choice. Figure 3 depicts how the weighted sample was winnowed to arrive at a final sub-sample. Only students who participated in all three waves of NELS:88 data collection and attended the same public high school for their entire secondary experience are included.[5] We regard students as exercising choice if they indicated, as eighth graders, they: (a) expected to attend a public high school in grade 10, (b) were considering another public high school, and (c) ultimately attended a selective public magnet school or a public school of choice.[6] In contrast, students are designated as not exercising school choice if they reported, as eighth graders, they: (a) expected to attend a public high school in grade 10, (b) were not considering another high school, and (c) ultimately did not attend a selective public magnet school or a public school of choice.[7] In order to maximize the duration of the choice/non-choice experience, We have imposed an additional constraint that the student attend the same public high school for all four years. Finally, students must be either Black not-Hispanic or Hispanic to be included in the study. An *N* of 1,360 students was selected after the above criteria were imposed. According to this definition, 311 Black and Hispanic students exercised school choice.[8]

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[4] A dummy variable is a simple categorical variable. In this case, students who exercise choice are assigned a value of one, while those who do not are assigned zero.
[5] That is, F2PNLFLG=1, G12CTRL=1 and F2S103=1, respectively.
[6] If BYS14=1 and BYS15=2 and BYS16=1 F2SC4B=1 or F2SC4C=1 AND F1C55=1 then choice = 1
[7] That is, if BYS14=1 and BYS15=1 and F2SC4B=2 and F2SC4C=2 and F1C55=2 then choice = 0
[8] 232 after listwise deletion

The remaining variables are listed alphabetically in Table 1. Latent variables 1988 achievement, 1992 achievement, effort, and fit are constructs that are measured indirectly by multiple indicators called factors or measurement variables. For example, the construct effort estimates student alignment with school expectations. Measurement variable, F2S25F2 asks the student about the amount of time spent on homework. Fit reflects students' perceptions of relationships with their teachers and with classmates of other racial groups. Item, F1S7E explores students' perceptions about racial harmony. In a sense, it is an appraisal of their social environment. Academic achievement is the obvious underlying construct for 1988 achievement and 1992 achievement, both are measured by sub-tests in reading, math, science, and social studies.

SES and academic rigor are composite variables constructed by the National Center of Education Statistics (NCES). While SES's components are fully described in Table 1, academic rigor's construction should be explained. Academic rigor indicates the student's high school program, as determined from transcript course-taking data. This composite variable is composed of subject area variables that aggregate Carnegie units by student and subject area.

Results

We used the Amos software (Analysis of Moment Structures; Arbuckle, 1995), which tests a model based on inputted correlations, standard deviations, and means. The evaluation of measurement and structural models require assessment of weighting, sample size, data-model fit, calculation of path coefficients, and reckoning effects of the independent variable on the dependent variable through mediators. Let us now turn our attention to each of these.

Sample

The study uses 853 valid cases after the listwise deletion of missing cases.[9] Is this sample large enough? Bentler (1993) recommends that the ratio of sample size to the number of parameters to be estimated be at the very least 5:1, preferably much larger (10:1 or even 50:1). Mueller (1996) advises at least a 10:1 ratio. Therefore, we conclude this study's sample is adequate since it exceeds a 10:1 threshold with 64 free parameters and 853 valid cases.

Table 2 describes the sample. Of the minority students who met the criteria for inclusion in this study, 58.2% were Black and 41.8% Hispanic; 56.7% were female and 43.3% male. This is consistent with previous findings that Black and female students are more likely to exercise school choice (Martinez, Godwin, & Kemerer, 1996). Furthermore, students enrolled in urban schools dominate the choice sub-sample. Students from the south comprise the majority in both the choice and non-choice sub-samples. This phenomenon is accounted for, at least in part, because NELS:88's initial sample consists disproportionately of southern students.[10] The entire sample has a very low mean SES value. However, students who chose their high school are slightly less disadvantaged than those who did not.

Non-normality and Multicollinearity

Non-normality and multicollinearity are serious data problems that have the potential to bias parameter estimates. According to Pedhazur & Schmelkin (1991) the Central Limit Theorem states, "As the sample size increases, the sampling distribution

[9] A case is excluded from the analysis if it has a missing value on any variable.
[10] Of the original NELS:88 sample, 13.9% of the students are from the northeast, 11.8% from the midwest, 21.6% from the west, and 52.7% from the south.

of the mean tends to approximate a normal distribution even when the population distribution is not normal" (p. 326). This theorem even applies to non-normal populations when the sample size exceeds 30 subjects (Pedhazur & Schmelkin, 1991). This study's sample of 1,360 subjects[11] substantially exceeds this number. Therefore, considering the sample's size, the Central Limit Theorem, and after a careful examination of all observed variables we conclude the data do not indicate population non-normality.

Regarding multicollinearity, Table 3 contains correlations among all observed variables. None exceeds 0.80, providing some reassurance that multicollinearity is not present (Berry & Feldman, 1985, p. 43). Not surprisingly, all items with high correlations[12] are limited to latent variables 1988 and 1992 achievement.

Figure 4 is the a priori model with parameter estimates. Fit values must equal or exceed 0.90 to be considered acceptable (Baldwin, 1989; Mueller, 1996). The GFI and the AGFI indices fall short of the 0.90 threshold making the data-model fit unsatisfactory. Therefore, theoretically justifiable modifications must be applied to the a priori model before any substantive judgments can be made about the relationships among variables (Mueller, 1996).

Modifications

Thus, survey or achievement items used to create latent variables were reconsidered in this light, and possible non-directional paths indicating covariance were identified. Next, associated modification indices for possible non-directional paths were

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[11] 853 after listwise deletion of missing cases
[12] ≥ .60

taken into account. Ten additional paths between residuals were selected based on these considerations. Modifications were terminated once acceptable data-model fit was achieved. It will be helpful for the reader to refer to Figure 5 as we describe each.

The first four modifications allow science, reading, mathematics, and history subtest residuals to covary.[13] The reason is straightforward. For example, a particular characteristic of science achievement not measured by the 1988 science achievement test also would not be measured by a similar science achievement test in 1992. Logic dictates these residuals should covary. Thus, a non-directional path drawn between the two residuals improves the data-model fit. This same logic is applied to the remaining tests used to construct 1988 and 1992 achievement.

Next, fit is modified. In 1990 and 1992 students were asked, "Students make friends with other racial groups."[14] Thus, it is likely their residuals covary because the identical question was repeated on two separate occasions. That which eluded measurement in 1990 is likely to evade measurement once again in 1992.

Effort's residuals constitute the remaining modifications. The first relate homework questions included in the 1992 student survey. "In the following subjects and overall, about how much time do you spend on homework each week, both in and out of school? Time spent on homework for *all other subjects* each (excluding mathematics, science, English, and history/social studies) each week?" and "Total time spent on homework out of school each week for all subjects."[15] These address the total time a

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[13] r5 ↔ r24, r4 ↔ r25, r3 ↔ r26, r2 ↔ r27
[14] r10 ↔ r11
[15] r21 ↔ r22

student spends on homework. Thus, measurement error associated with homework time is likely to covary for both questions.

The logic for the next four modifications is not quite as apparent, but equally justified. In 1992 students were asked two sets of parallel questions about their science and math classes. Briefly these are, "In your current or most recent science/math class how often did (do) you do the following: pay attention in class, complete your work on time, do more work than required, and participated actively?" We contend that students often behave similarly in science and math classes.

The first modification implies attentive science students also do more work than required in math.[16] The second posits attentive science students also participate actively in math class.[17] Third, students who do more work than required in science are also attentive math students.[18] Finally, attentive math students also complete their work on time in science.[19]

Results Following Modifications

Modifying the originally specified model results in acceptable fit indices; GFI and AGFI =.9. Data-model fit becomes sufficient thus permitting a post hoc analysis. Next, we examine factor loadings and tests of significance for latent variables, 1988 achievement, fit, effort, and 1992 achievement. The first concern is whether an observed variable's factor loading is statistically significant. The critical ratio (C.R.) or t-value offers a significance estimate. C.R. values greater than 1.65 are generally regarded as statistically significant for

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[16] r13 ↔ r19
[17] r13 ↔ r20
[18] r15 ↔ r17
[19] r17 ↔ r18

a one-tailed test at the .05 level of significance.[20] All factor loadings are positive and are statistically significant as their associated t-values exceed 1.65. (Table 4 contains critical ratios for all variables.) Thus, they are regarded as statistically significant for a one-tailed test at the .05 level of significance. Furthermore, factor loadings with rounded values greater than or equal to .4 can be considered meaningful (Pedhazur & Schmelkin, 1991, p. 603). In this case, all but two observed variables meet this criterion; one (F2S7B) belongs to fit and the other (F2S25E2) belongs to effort. In summary, we conclude the measured variables are satisfactory for inclusion in the structural model.

Let us now turn to the structural parameters in Table 5 to better understand relationships among the model's variables. The reader should note the direction and relative strength of each path remains unchanged following modifications. Therefore, despite slight modifications to the originally specified model, the theory upon which the model was originally constructed remains consistent with the data.

The squared multiple correlation (R^2) associated with 1992 achievement is .856. Put another way, the model explains 86% of 1992 achievement's variance. The originally specified model's R^2 was .95. This decrease is the result of permitting measurement errors associated with latent variables 1988 and 1992 achievement to covary. Still, an R^2 of .86 is rather substantial, meaning the modified model explains most of 1992 achievement's variance. Using beta coefficients in Table 5 to calculate the indirect effect of school choice on achievement, we find once again that it is zero. When Black or Hispanic students choose, are accepted by a public high school and remain in the same school for their entire secondary experience, academic achievement does not increase as a result.

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[20] C.R. $\geq$ 1.65 for a one-tailed test of significance.

Perhaps an easier way to conceptualize these data is to graphically think about the relative strengths of the structural model's paths. Figure 6 is constructed using two criteria. First, a path must be statistically significant in order for it to have a solid line. Thus all solid lines have critical ratios greater than 1.65. Statistical significance and practical significance are not necessarily synonymous. Figure 6 includes the additional dimension of practical effect or magnitude. That is, the practical effect of statistically significant paths with standardized coefficients greater than .05 are considered small but meaningful, above .10 moderate, while paths above .25 are strong (Keith, 1993, p. 26). The figure's key encapsulates these two aspects of significance.

Let us briefly examine Figure 6 in light of extant literature. A strong effect of SES's on 1988 achievement is not surprising. We have long known that students with advantaged backgrounds are more likely to do better in school because, for example, they have enriching familial experiences and access to higher-quality schooling (Adams & Singh, 1996; Manski, 1994). Even though the sample's SES is truncated due to race, its influence remains strong. The moderate effect between SES and school choice supports previous research findings (Archbald, 1996; Goldring, 1993; Manski, 1994).

That is to say "choosers" are higher in SES than students who did not choose their high school. Even though the entire sample's SES mean is low (-.44), the mean for students exercising choice (-.36) is slightly higher than whose who do not (-.46). Additionally, Black and Hispanic students choosing their high school enjoy a slightly more racially hospitable and supportive experience as demonstrated by the path from school choice to fit (Blank, et al., 1996; Goodenow & Grady, 1993; Henig, 1995). The path

between fit and effort is strong (Greeley, 1982; Hill, 1996; Newmann, 1990). It suggests minority students who enjoy an acceptable school fit consequently work harder.

Not surprisingly, 1988 achievement's effect on academic rigor and achievement 1992 is strong (Clune, 1990; Lee, 1993; Lee & Byrk, 1988). Good grammar school students are more likely to enroll and excel in academically challenging high school courses. The converse is also true; less capable students' substandard achievement test performance influences their enrollment in academically mediocre classes. Perhaps students are assigned to different levels of curricula depending on their prior academic performance. This high school practice is commonly called tracking.

Academic rigor's magnitude (β = .04) renders its statistically significant effect on 1992 achievement meaningless; its mean, 2.3, indicates that, on average, students in the sample chose the least rigorous of all academic tracks. Students needed only to complete 12 Carnegie units by their senior year of high school to fall within this category. Donato, Menchaca, & Valencia (1993) points out minority students often are tracked into lower-performing groupings. This claim is consistent with ACT's (1996) findings; minority students are less likely than Whites to take college-prep courses in high school and earn higher grades in them. Therefore, because they are enrolled in easier classes than their White counterparts, their academic performance pales. This finding underscores the need for minorities to enter secondary school at high performance levels in order to profit most from their secondary experience.

Socioeconomic status (SES) paths to academic track enrollments and 1992 achievement are not significant. This is due, to a large part, to 1988 achievement's strong effect on 1992 achievement. In this case, most of SES's achievement's variance

is absorbed by 1988 achievement. Combine this exceptional relationship with 1988 achievement's strong effect on 1992 achievement and there is very little variance between SES and academic rigor or 1992 achievement left to explain.

The path representing 1988 achievement's influence on school choice is not significant. There is no evidence that one's prior achievement influences a student's propensity to choose their high school, at least as far as Black and Hispanic students are concerned. SES is a much better predictor of a student's behavior relative to school choice.

School choice's influence on effort is also not significant. It seems choosing one's school does not directly cause one to work harder. Instead, Black and Hispanic students report working harder because they experience a more supportive environment as measured by fit. In this way, school choice indirectly influences effort.

School choice's indirect influence on the dependent variable is nonexistent because the weak paths between school choice/fit and school choice/effort effectively neutralizes its effects on 1992 achievement. As a result, the total effect of school choice on academic achievement is nonexistent (.000). Another way to think about these results is to consider the simple bivariate correlation between school choice and academic achievement absent statistical controls or intervening variables. The school choice/1992 achievement correlation is merely .069. Borg and Gall (1977) suggest correlations (*r*) between .20 and .25 show only a slight relationship. Thus, the authors conclude correlations within this range have no value for individual or group predictions. In variance terms, a correlation of .069 indicates that less than 1 percent of the variance

in the two variables are common to both.[21] Hence, there is not much of a school choice/1992 achievement relationship that bears explanation in the first place.

Summary and Discussion

Results from this study are organized into first-order and second-order findings. The first-order finding relates to the study's main purpose while second-order findings refer to noteworthy relationships between school choice and several of the mediating variables.

First-order Finding: School Choice and Achievement

The first-order finding refers to the overall question regarding the indirect relationship between school choice and 1992 achievement through mediating variables. Simply, this research demonstrates school choice has no indirect effect on the academic achievement of Black and Hispanic students. When Black or Hispanic students choose and are accepted by a public high school, and remain in that same school for their entire secondary experience, their academic achievement does not increase as a result. This finding is consistent with previous research (Capell, 1981; Driscoll, 1993; Lee, Coladarci, & Donaldson, 1996; Witte, Thorn, Pritchard, & Claibourn, 1994). However, it contradicts Archbald's (1995), Blank's (1990), and Gamoran's (1996) results. This last group of studies is limited to magnet schools, while this investigation includes several types of public schools of choice.

School choice fails to influence 1992 achievement for two main reasons, a small correlation and the model's weak paths between these two variables. First, consider that

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[21] This is simply the Pearson product-moment correlation squared (r^2), also called the coefficient of determination.

the correlation between school choice and 1992 achievement is small (.069), but statistically significant. However, when the confounding influence of prior achievement is controlled, very little variance in 1992 achievement remains to be explained by other variables, such as school choice. We have long known that prior achievement is an excellent predictor of academic success (Keith & Benson, 1992; Haertel et al., 1983; Willms, 1985; Witte, 1992). What is surprising here is the strength of 1988 achievement's path to 1992 achievement (β =.92).

One reason this path's strength is so dramatic is because the achievement tests used in 1988 and 1992 are very similar. These tests were subject to tight time constraints, limiting the number of items. To address this issue Educational Testing Service (ETS) used a multilevel design to guard against ceiling and floor effects. The design calls for six forms of the 1992 test battery. Each form is comprised of a different combination of items representing different mathematics and reading levels.[22] Students' 1988 test scores determined their 1992 test forms. So, for example, a student scoring in the top quartile in the 1988 math sub-test was given a more difficult math test in 1992 and vice versa. Good test design and a close matching of test items accounts for much of this path's strength.

Second, the weak link between school choice and fit, plus a non-significant link between school choice and effort, effectively neutralizes any influence school choice might exert on 1992 achievement via either path (see Figure 6). Here the "weakest link" principle comes into play. That is, since decimal coefficients (β's) are used to describe each path, the path's total value will always be diluted by the value of its smallest link (Davis, 1985).

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[22] An examination of the NELS:88 achievement tests results by ETS and NCES found no evidence to suggest these tests are racially biased (U.S. Department of Education, 1995c).

Second-order Findings

All remaining findings are of the second order. That is to say, specific results are grouped into general findings, according to school choice's relationship with several of the model's mediating variables. These second-order findings offer additional insight into public school choice policy.

School Choice and Socioeconomic Status

As a family's SES increases, the tendency to exercise choice also increases. This phenomenon is apparent as the sample's SES[23] is higher for choice students (M = -.361) compared to non-choice students (M = -.459). Furthermore, this difference is statistically significant ($p < .05$, two-tailed). This tendency is documented in the extant literature. For example, low-income parents with children attending Milwaukee's public school choice program had higher educational levels than parents in a matched control group with children enrolled in the city's traditional public schools (Witte, 1996).

A low mean SES (-.436) overall is expected because this study is limited to Black and Hispanic public school students who, according to national data, have average incomes that are lower than Whites. Lower income families tend to choose within the public sector while wealthy families are drawn to private schools. A survey conducted by the U. S. Department of Education found families with household incomes below $30,000 are more likely to exercise public school choice, while families with incomes greater than $50,000 are drawn to private schools (National Center for Education Statistics, 1995).

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[23] SES is a composite variable that includes parents' income, occupation, and education.

The school choice/SES relationship is particularly worrisome for non-choosing students. A recent study conducted in Cincinnati and St. Louis found that magnet schools attract students from higher SES strata as well as better-educated teachers (Goldring & Smrekar, 1995). Additionally, if state aid is deducted on a per-pupil basis, children who do not choose will be penalized because of reduced programming due to declining revenues. This "creaming effect" may only exacerbate an already woeful condition of class segregation in public schools. Thus, the poorest of our nation's minority children are more likely to experience adverse effects as a result of an expansion of public school choice policy.

School Choice and Fit

Choosing a high school increases the likelihood that Black and Hispanic students will feel that they "fit in" the school. Students choose a school for a variety of reasons. As Maddaus (1990) points out, school choice is not only driven by academic considerations but also by one's beliefs, attitudes, and values. This finding clearly underscores his point. Students who remained in their chosen high school for their entire secondary experience did so, in part, because they felt they belonged. They felt supported and welcomed by teachers and other students. Parents and students may choose a particular school for its values, beliefs, or climate rather than student achievement (Goldring & Hausman, 1996).

This finding offers hope that school choice could empower minorities (Raywid, 1984). Choosing empowers, leading to positive school experiences that could, eventually, result in minority school behaviors becoming culturally sanctioned. Thus, Ogbu (1982) believes that with time, schools will become more racially supportive as these positive attitudes begin to reshape the public school culture.

Relationships among students and teachers constitute a form of "social capital" (Coleman, 1988). Social capital can be thought of as a group's set of norms resulting in certain obligations and expectations on the part of its members. School choice can, in time, reshape the school culture and increase the amount of social capital available to Black and Hispanic students. While social capital will not directly impact academic achievement, it might do so indirectly by, for example, increasing the amount of effort students put into their studies.

School Choice and Effort

We posited that choosing a public high school *directly* increases student effort. This assumption was incorrect as the correlation between school choice and effort is small and non-significant. Therefore, it is unlikely Black or Hispanic students do more homework and pay greater attention in class as a direct result of choosing their public high school. This finding contradicts previous literature (Greeley, 1982; Hoffer, Greeley, & Coleman, 1985). These studies were conducted in Catholic high schools.

There is, however, an *indirect* effect between school choice and effort. Students who feel supported and encouraged by their teachers and peers (fit) report doing more homework and being more attentive in class. This finding bears out previous research (Coleman, 1988; Kottkamp, 1979; Lee & Byrk, 1989; Murnane, 1984), suggesting school climate, as evidenced by high teacher expectations and positive student-teacher relationships, may have more to do with increasing students' effort than simply the act of choosing one's school.

Interestingly, this study may be more like Catholic school studies (Greeley, 1982; Hoffer, Greeley, & Coleman, 1985) than first assumed. That is, both school types

experience increased student effort because choosing fosters a sense of belonging and support and this increases student effort. The difference here is that *all* Catholic high school students choose in one way or another. Consequently, school choice's effect on effort *appears* to be a direct result of choosing one's school.

A direct effect on effort may be due to admission practices rather than the simple act of choosing one's school. By their nature, Catholic schools are truly selective. This increases the likelihood selected students will feel special thus causing them to expend more effort as a direct result of selective admission. Even though the schools included in this study claim to be selective schools of choice, their admission practices may not be significantly different than their traditional public school counterparts ~~(see Appendix B)~~.

School Choice and Academic Program

We did not posit that school choice directly influences academic rigor. However, academic rigor has a *statistically significant* influence on achievement (Hartel et al., 1983; Keith & Cool, 1992; Lee & Byrk, 1988). Its magnitude, however, renders its practical effect meaningless. All students included in the sample enrolled in less rigorous academic programs, as measured by completed Carnegie units. Academic rigor's mean (2.3) for students who chose their high school is slightly higher compared to those who did not (2.1), this difference is statistically significant ($p < .05$, two-tailed). Even though the difference between these two means is statistically significant, both means are indicative of a less rigorous academic track. This is consistent with the extant literature. Compared to White students, Black and Hispanic students are less likely to successfully complete advanced level classes in high school (ACT, 1996; Donato et al., 1993; Noble, 1996).

One reason for this finding may be that the traditional rational-bureaucratic model for organizing most public high schools is based on the premise that the diverse needs of dissimilar people are best served by creating organizations that differentiate roles and services to respond to special needs. For example, several studies (Barr & Dreeben, 1983; Coleman, Hoffer, & Kilgore, 1982; Heyns, 1974; Lee & Byrk, 1988; Oakes, 1985) report that the typical bureaucratic response to an increasingly racially diverse student body results in re-segregating students within schools through specialized programming, more commonly referred to as "tracking." Even though minority students attend the same school as Whites, their schooling experience is quite different (Epstein, 1980). This, in part, causes substantial differences in academic achievement among students (Newmann, 1990).

It is critically important, however, that Black and Hispanic students enroll in academically challenging classes if they are to ever realize academic parity with their White counterparts. The correlation between choice and academic rigor is significant (.153, $p < .01$, two-tailed). However, a path between these two variables was not posited in the model because the literature on school choice did not offer any reason to suspect a direct relationship. Clearly, this finding offers implications for further research.

Limitations and Implications

The most frequently cited limitation of structural equation modeling is that a hypothesized model is only one possible explanation of the phenomenon in question, other models may offer equally justifiable explanations. This would be the true if school choice had an appreciable indirect effect on 1992 achievement, but this is not the case. The

correlation between these two variables is small (.069). Adding other mediating variables or improving existing mediating variables will not strengthen this relationship.

However, the nature NELS:88 data hinders several second-order findings. Sosniak and Ethington (1992) note particular limitations regarding NELS:88 and school choice investigations. First, NELS:88 data do allow us to determine if the public school uses some form of admission criteria. However, the available options do not include more common practices in public schools of choice, for example, selective admission by lottery to achieve racial balance. Second, these data cannot provide specific details about the subtle nature of classroom discussions, homework assignments, or laboratory work.

Consider, for example, the latent variables effort and academic rigor. For testing this model, a more comprehensive measure of student effort would be desirable. Effort is constructed mainly of mathematics and science items, as well as several homework questions, so student effort in English and history must be inferred. Although effort's items have some internal consistency (Cronbach's coefficient alpha is .76), we would prefer that more items be directly related to a student's effort in particular subjects. Hopefully, future data-collection efforts by the National Center for Education Statistics National Education Longitudinal Studies Program will include improved items.

Academic rigor is simply a measure of the number of Carnegie units completed by students during their high school career. Rigor is better measured by qualities such as the course's track - - advanced placement, college preparatory, business, or general level; or a student's selection of courses - - chemistry vs. shop, etc. Future studies should include some measure of course quality.

Finally, even though these findings are based on data from a large, nationally representative sample, there is still a small possibility these results are sample specific. For example, a study of public school choice availability found greater student participation in the west (National Center for Education Statistics, 1996). However, southern students dominate NELS:88. We suspect it may have to do with NELS:88's deliberate oversampling of Blacks and Hispanics. That is to say, more Blacks and Hispanic lived in the south compared to other geographic regions in 1988. Still, cross-validation using another database would be reassuring.

Replication of any study is important and its potential to strengthen the literature should not be ignored. Future researchers will do well to replicate this study using different data sets. While it too should be nationally representative and employ an orthodox definition of school choice, it also should include more items to better measure student effort and academic rigor.

This study found a statistically significant correlation between school choice and academic rigor (.153), but no path was posited between these variables. Further investigation into the choice/academic rigor relationship is recommended. No literature was found to support a theoretically justifiable direct relationship between these two variables. However, future studies may uncover factors, common to both variables, to better help understand ways to encourage minority student enrollment in academically challenging classes.

The relationships among school choice, fit, effort, and academic rigor gives rise to wonder if the effects of school choice are similar for Black and Hispanic students in Catholic and in public schools. For example, this study indicates school choice

influences effort only indirectly through fit in the public school setting. Is this also true for Catholic schools, or do Black and Hispanic students choosing Catholic schools expend more effort as a *direct* result of their choice? Perhaps a variation of Coleman, Hoffer, and Kilgor's (1982) study comparing public and Catholic schools would answer these questions.

Such comparisons are possible because the NELS:88 data set includes Catholic schools. Therefore, the school choice variable could be altered slightly to compare Black and Hispanic students who chose a Catholic versus a public high school of choice. Perhaps Black and Hispanic students experience improved fit and increased effort in both settings, but are more likely to enroll in a more academically rigorous program in Catholic schools and experience higher academic achievement as a result. If this were so, what are the policy implications? Irrespective of legal considerations, can Black and Hispanic achievement improve by extending publicly supported choice to Catholic schools?

Conclusions

These findings have significant policy implications for President Clinton's *Call to Action for American Education in the 21st Century* that challenges states to provide parents with more choice in public education. The Clinton Administration is clearly committed to increasing the number of charter schools from 400 to 3,000 by the year 2000. For example, the U.S. Department of Education has appropriated $51million in FY '97 and $80 million in FY '98 for the implementation and evaluation of charter schools.

What is interesting about this goal is that the Administration requires these charter schools to adhere to certain equity principles. For example, they must be public and non-sectarian, open to all students, and they must comply with civil rights laws. In this regard, charter schools seem very similar to the public schools of choice that are included in this study. If this is true, it is very unlikely that Black and Hispanic students will fare any better in newly created charter schools than in other public schools of choice.

Additionally, the current administration's charter school initiative raises questions about equity. Will poor people have equal access to information about charter schools? What of the children who remain in traditional public school settings? Will these schools suffer from declining revenues and a loss of talent as their most able and higher SES students elect to attend charter schools much like we have seen with magnet schools? Will the most talented teachers opt to work in charters instead of traditional public school settings? These are troubling questions for minority children, especially since it is unlikely that there are any academic gains associated with public school choice.

Like so many other policy issues, empirical evidence is viewed against a complex patchwork of prevailing social and political beliefs. For the past 10 years, in particular, the merits of public school choice have been hotly contested from two camps.

School choice critics, such as the mainstream educational establishment, contend school choice has no advantage over traditional public schools. Moore and Davenport summarize this camp's sentiment as follows, "School choice has proven risks and unproven benefits for students at risk, and has represented a new and more subtle form of discriminatory sorting...." (1990, p. 221). This group does not want to risk

exacerbating an unjust situation where race and class already sort students, especially since choice has no academic effect for minority students who tend to attend poorer schools.

Choice proponents favor some form of regulated school choice such as within school choice, within district choice (including magnets), between districts choice (including magnets), and charter schools (Coons & Sugarman, 1978, 1992; Raywid, 1987b). For many, school choice is a means to redistribute power to the poor and disenfranchised. They argue that choice within the public sector offers a degree of competition leading to improved schools and subsequently a better educational outlook for Black and Hispanic students.

Although this study clearly demonstrates public school choice does not influence minority students' academic achievement, it does, however, offer evidence to support the claim that minority students who choose feel as if they belong and are supported at school. In light of these findings, future choice advocates might base their arguments on affective claims rather than the claim school choice promotes academic achievement.

It is impossible to extricate politics from school choice policy. Consider, for example, a recent newspaper editorial.

> If poor and minority children were allowed to go to the schools of their choice, their education would improve to the level where they could compete for college admission with everyone else. They wouldn't need a two-track admission system of remedial programs. Unfortunately, the education lobby and its political allies don't want to open themselves to competition because they would lose their

> political power, and they are willing to sacrifice even the future of children in order to maintain that power (Thomas, 1997, p. A9).

The rhetoric associated with school choice is awash with so many social, economic, and political misconceptions that it is almost impossible to practically distinguish banal platitudes from solid empirical evidence.

School choice's popularity among minorities is a predictable reaction to an inequitable and immutable public school system. It is little wonder, given their current educational situation, why many Blacks and Hispanics elect to exercise choice. Our nation's future depends on whether or not we have the moral and political will to educate and empower all citizens. Thus, we are compelled to continue to seek more effective avenues to ensure academic success for all children, irrespective of their race or family's wealth, while at the same time, ensuring equitable access and opportunities.

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Table 1

Description of Items

Variable	Question or Item	Responses
Academic Rigor		
F2RTRPRG	Composite variable indicating the student's high school program as determined from transcript data.	0=student's academic program did not meet classification criteria 1=vocational track (Three units of vocational subjects.) 2=academic track (Twelve Carnegie units in either English, social studies, science, and math) 3=academic and vocational track (Met criteria for academic and vocational track, but not rigorous academic track, fifteen Carnegie units.) 4=rigorous academic track (4 English units, 3 units each in social studies, science, and math; 2 foreign language units, and .5 unit of computer science, fifteen and one-half Carnegie units) 5=rigorous academic and vocational track (Met criteria for rigorous academic and vocational tracks, eighteen and one-half Carnegie units.)

Table 1. (cont.)

Variable	Question or Item	Responses
1988 Achievement (α=.879)[a]		
BY2XHSTD	1988 standardized history achievement score	mean=50, *SD=10*
BY2XMSTD	1988 standardized mathematics achievement score	
BY2XRSTD	1988 standardized reading achievement score	
BY2XSSTD	1988 standardized science achievement score	
1992 Achievement (α=.905)		
F22XHSTD	1992 standardized history achievement score	mean=50, *SD=10*
F22XMSTD	1992 standardized mathematics achievement score	
F22XRSTD	1992 standardized reading achievement score	
F22XSSTD	1992 standardized science achievement score	
Effort (α=.761)		
F2S17A	In your current or most recent science class how often do/did you pay attention in class?	1=never 2=rarely
F2S17B	In your current or most recent science class how often do/did you complete your work on time?	3=sometimes 4=often
F2S17C	In your current or most recent science class how often do/did more work than was required of you?	5=always
F2S17D	In your current or most recent science class how often do/did you participate actively in class?	
F2S21A	In your current or most recent math class how often do/did you pay attention in class?	

Table 1. (cont.)

Variable	Question or Item	Responses
Effort (cont.)		
F2S25E2	Total time spent on homework for all other subjects out of school each week *excluding math, science, English, and history.*	0=none 1=less than one hour 2=one to three hours
F2S25F2	Total time spent on homework out of school each week *all subjects.*	3=four to six hours 4=ten to twelve hours 5=thirteen to fifteen hours 6=sixteen to twenty hours 7=over twenty hours
Fit (α=.654)		
F1S7A	Students get along well with teachers.	4=strongly agree
F1S7H	Teachers are interested in students.	3=agree
F2S7D	Teachers are interested in students.	2=disagree
F1S7L	Most of my teachers really listen to what I have to say.	1=strongly disagree
F1S7E	Students make friends with other racial groups.	
F2S7B	Students make friends with other racial groups.	
SES		
F2SES1	Continuous variable indicating student's socioeconomic status constructed from the base-year parent questionnaire. Included are the father's and mother's education levels, occupations, and family income.	Mean = 0, *SD* = 1

Table 2

Sample Description (N=1,360)

	Total		Choice		Non-choice	
	N	%	N	%	N	%
Race						
Black	791	58.2	222	16.3	569	41.9
Hispanic	569	41.8	89	6.6	480	35.3
Sex						
Male	589	43.3	109	8.0	480	35.3
Female	771	56.7	202	14.8	569	41.8
Region						
Northeast	189	13.9	45	3.3	144	10.6
Midwest	160	11.8	33	2.5	126	9.3
South	717	52.7	172	12.7	545	40.1
West	294	21.6	60	4.4	233	17.2
Urbanicity						
Urban	537	39.5	167	12.3	370	27.2
Suburban	442	32.5	90	6.6	352	25.9
Rural	381	28.0	53	3.9	328	24.1
SES	1,360	(-.436)[a b]	(-.361)[c]		(-.459)[c]	

[a] Values enclosed within parentheses represent means.

[b] The range for NELS:88's entire 1992 panel is –3.243 to 2.753.

[c] The difference between these means is statistically significant, $p < .05$, two-tailed.

Table 3

Intercorrelations, Means, and Standard Deviations

	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	SES	1.000									
(2)	History 88	.199**	1.000								
(3)	Math 88	.325**	.559**	1.000							
(4)	Reading 88	.264**	.675**	.641**	1.000						
(5)	Science 88	.242**	.578**	.665**	.605**	1.000					
(6)	Choice	.128**	.088*	.045	.118**	-.011	1.000				
(7)	FIS7A	.124**	.057	.073*	.104**	.090**	.024**	1.000			
(8)	F1S7H	.041	-.011	.036	.068*	.028	.017	.324**	1.000		
(9)	F1S7L	.013	.051	.005	.040	.037	.038	.318**	.399**	1.000	
(10)	F1S7E	.014	-.028	-.045	-.023	.008	.114**	.229**	.173**	.266**	1.000
(11)	F2S7B	-.070*	-.112**	-.060	-.098**	-.069*	-.001	.062**	.189**	.140**	.287**
(12)	F2S7D	-.055	.006	.087*	.041	-.011	-.021	.111**	.334**	.154**	-.014
(13)	F2S25E2	-.064	-.069*	-.068*	-.041	-.077*	-.032	-.030	.061	-.016	-.103
(14)	F2S25F2	-.019	.111**	.138**	.133**	.114**	.014	.034	.059	.021	-.025
(15)	F2S21D	.027	.002	.025	.006	.014	-.019	-.022	.075*	.037	.010

Table 3. (cont.)

Variables		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(16)	F2S21C	-.034	-.071*	-.043	-.105**	-.039	-.001	.023	.043	.112**	.123**
(17)	F2S21B	-.006	-.074*	-.076*	-.024	-.022	.003	.081*	.047	.039	.048
(18)	F2S21A	-.077*	-.001	-.037	.051	-.011	.023	.067*	.056**	.065	.031
(19)	F2S17D	.007	.036	.009	.002	.098**	.011	.022	.093**	.036	.056
(20)	F2S17C	-.031	-.045	-.038	-.090**	.040	-.032	.004	.078*	.092**	.073*
(21)	F2S17B	.040	.014	.019	.044	.050	-.012	.080*	.123**	.113**	.060
(22)	F2S17A	-.045	-.059	-.062	-.054	.019	-.036	.110**	.188**	.186**	.088*
(23)	Acad Rigor	.136**	.219**	.243**	.261**	.196**	.153**	.124**	.077*	.073*	.049
(24)	History 92	.201**	.679**	.554**	.651**	.580**	.076*	.118**	.091**	-.012	-.016
(25)	Math 92	.290**	.555**	.799**	.633**	.598**	.074*	.170**	.095**	.048	.047
(26)	Reading 92	.216**	.609**	.063**	.747**	.573**	.092**	.158**	.128**	.053	-.003
(27)	Science 92	.300**	.538**	.678**	.583**	.682**	-.001	.099**	.084*	-.021	.256
(28)	Achieve 88	.303**	.840**	.841**	.866**	.837**	.073	.095**	.035	.040	-.026
(29)	Fit	.019	-.010	.024	.036	.023	.078*	.591**	.681**	.661**	.569**
(30)	Effort	-.037	-.014	-.004	.003	.038	-.013	.043	.146**	.105**	.048

Table 3 (cont.)

Variables		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(31)	Achieve 92	.288**	.685**	.757**	.752**	.698**	.069*	.156**	.115**	.019	.015
	M	-.399	49.068	47.937	48.903	48.155	.232	2.723	2.887	2.838	3.207
	SD	.776	9.222	8.298	8.769	8.406	.423	.583	.632	.686	.685

*$p < .05$. **$p < .01$. (two-tailed)

Variables		(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(11)	F2S7B	1.000									
(12)	F2S7D	.208**	1.000								
(13)	F2S25E2	-.088**	.108**	1.000							
(14)	F2S25F2	-.032	.139**	.548**	1.000						
(15)	F2S21D	.001	.142**	.139**	.185**	1.000					
(16)	F2S21C	.052	.189**	.115**	.194**	.457**	1.000				
(17)	F2S21B	.020	.061	.062	.128*	.381**	.370**	1.000			
(18)	F2S21A	.006	.184**	.221**	.190**	.450**	.295**	.510**	1.000		
(19)	F2S17D	-.002	.096**	.057	.118**	.396**	.243**	.162**	.136**	1.000	
(20)	F2S17C	.016	.095**	.130**	.262**	.232**	.447**	.176**	.133**	.396**	1.000
(21)	F2S17B	-.009	.057	.095**	.220**	.246**	.242**	.374**	.250**	.285**	.325**
(22)	F2S17A	.055	.140**	.208**	.258**	.089**	.201**	.187**	.377**	.386**	.392**

Table 3 (cont.)

Variables		(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(23)	Acad Rigor	.018	.052	-.016	.012	.033	.019	.065	.064	.064	-.010
(24)	History 92	-.108**	.048	-.063	.072*	-.011	-.111**	-.103**	-.053	.056	-.081*
(25)	Math 92	-.026	.072*	-.080*	.157**	.006	-.098**	-.047	.008	.010	-.066
(26)	Reading 92	-.052	.059	-.064	.102**	-.026	-.168**	-.074*	.023	.023	-.112**
(27)	Science 92	-.056	.041	-.048	.131**	.011	-.076*	-.087*	-.015	.045	-.027
(28)	Achieve 88	-.101**	.036	-.075*	.146**	.014	-.077*	-.058	.001	.043	-.040
(29)	Fit	.551**	.488**	-.022	.053	.068*	.142**	.083*	.142**	.085*	.103**
(30)	Effort	-.005	.216**	.523**	.642**	.625**	.622**	.518**	.567**	.517**	.600**
(31)	Achieve 92	-.070*	.063	-.073*	.132**	-.006	-.131**	-.090**	-.011	.039	-.083*
	M	3.131	2.942	1.907	3.443	3.750	2.445	4.174	4.368	3.933	2.419
	SD	.605	.598	1.337	1.865	1.191	1.282	.851	.857	1.017	1.105

*$p < .05$. **$p < .01$. (two-tailed)

Variables		(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
(21)	F2S17B	1.000									
(22)	F2S17A	.401**	1.000								
(23)	Acad Rigor	.046	-.049	1.000							
(24)	History 92	-.046	-.075*	.248**	1.000						

Table 3 (cont.)

Variables		(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
(25)	Math 92	-.001	-.030	.310*	.619**	1.000					
(26)	Reading 92	.038	.009	.244**	.718**	.693**	1.000				
(27)	Science 92	.011	.048	.169**	.660**	.724**	.647**	1.000			
(28)	Achieve 88	.037	-.047	.272**	.730**	.761**	.752**	.730**	1.000		
(29)	Fit	.121**	.218**	.109**	.031	.112**	.094**	.046	.021	1.000	
(30)	Effort	.530**	.574**	.012	-.057	-.009	-.039	.011	.005	.155**	1.000
(31)	Achieve 92	.001	-.014	.278**	.863**	.868**	.882**	.869**	.854**	.081*	-.027
	M	4.254	4.183	2.325	48.690	48.156	48.694	46.545	194.063	17.726	34.877
	SD	.752	.845	1.253	8.739	8.254	9.025	8.654	29.343	2.243	6.436

Variables		(31)
(31)	Achieve 92	1.000
	M	192.084
	SD	30.179

*$p < .05$. **$p < .01$. (two-tailed)

Note. Listwise N = 853.

Table 4

Measurement Model's Critical Ratios

Variable	Observed Variable	C.R.[a]
1988 Achievement		
	BY2XHSTD	
	BY2XSSTD	22.299
	BY2XRSTD	23.906
	BY2XMSTD	23.447
Fit		
	F1S7A	
	F1S7H	9.977
	F1S7L	9.751
	F1S7E	6.810
	F2S7B	6.263
	F2S7D	7.617
Effort		
	F2S17A	
	F2S17B	12.146
	F2S17C	13.315
	F2S17D	12.805
	F2S21A	13.274
	F2S21B	11.099
	F2S21C	13.343
	F2S21D	13.361
	F2S25F2	8.853
	F2S25E2	6.510

Table 4 (cont.)

Variable	Observed Variable	C.R.[a]
1992 Achievement		
	F22XSSTD	
	F2SXRSTD	27.629
	F22XMSTD	27.549
	F22XHSTD	26.378

Note: The first observed variable in each latent variable does not have a C.R. value. This is because the parameter is fixed at 1.0 in order to establish a common measurement scale for the latent variable.

[a] $p < .05$ (one-tailed) for all C.R. values ≥ 1.65

Table 5

Modified Model's Path Estimates and Critical Values

Path	β	C.R.[a]
1988 Achievement ← SES	.332	9.157
School Choice ← SES	.113	3.126
School Choice ← 1988 Achievement	.044	1.151
Fit ← School Choice	.078	1.850
Effort ← Fit	.277	5.621
Effort ← School Choice	-.047	-1.331
Academic Rigor ← SES	.045	1.273
Academic Rigor ← 1988 Achievement	.274	7.093
Academic Rigor ← Effort	.010	.275
1992 Achievement ← SES	-.006	-.295
1992 Achievement ← 1988 Achievement	.916	21.625
1992 Achievement ← Effort	-.009	-.464
1992 Achievement ← Academic Rigor	.036	1.850

[a] $p < .05$ (one-tailed) for all C.R. values ≥ 1.65

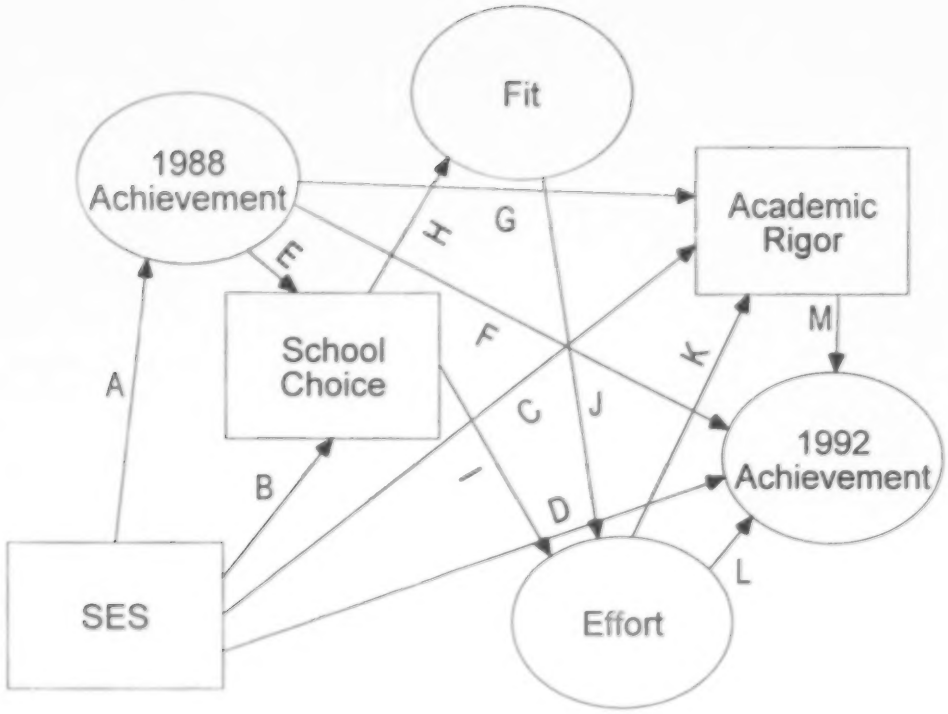

Figure 1. Structural model depicting the indirect effect of school choice on the academic achievement of Black and Hispanic high school students.

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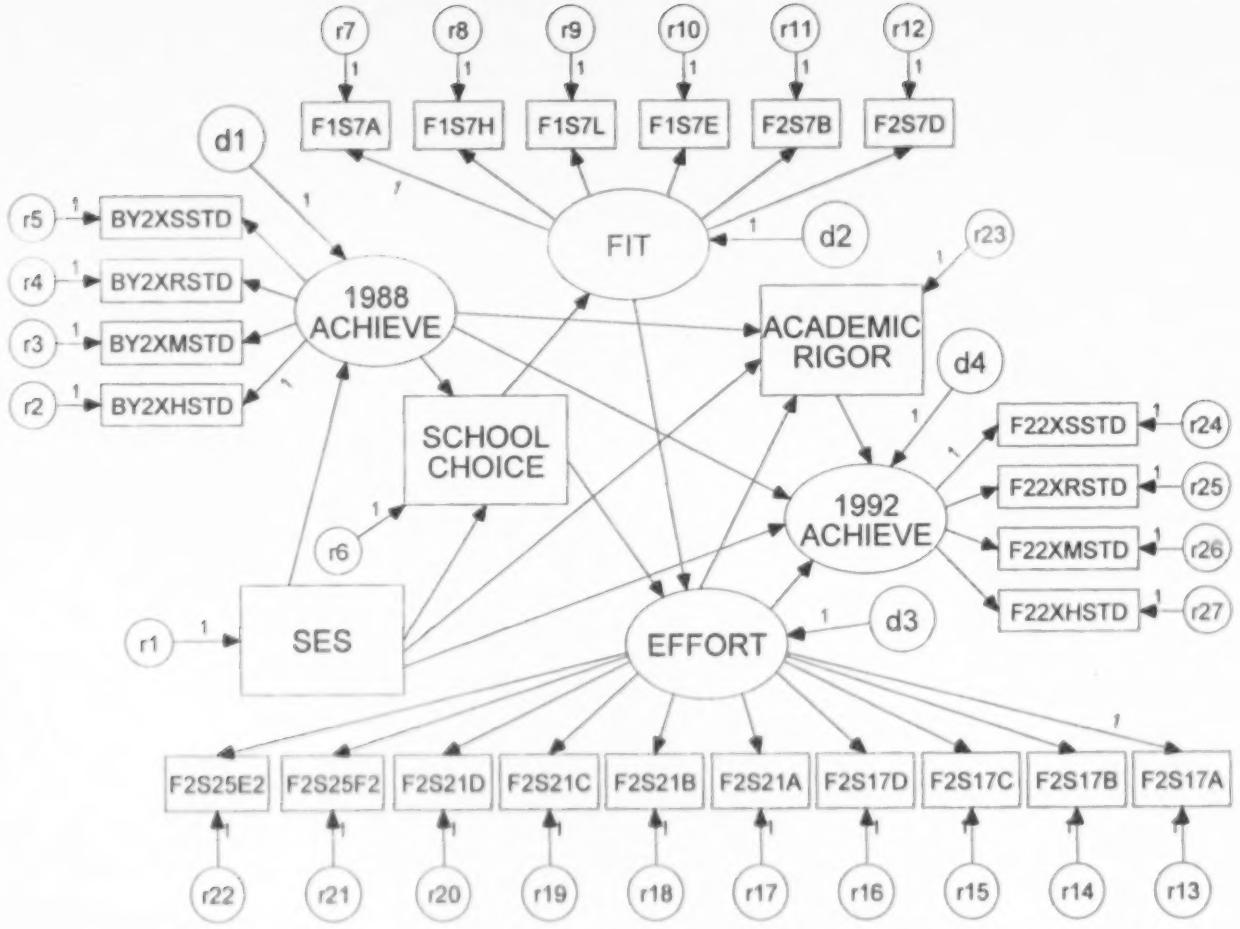

Figure 2. A priori model depicting the indirect effect of school choice on the academic achievement of Black and Hispanic high school students.

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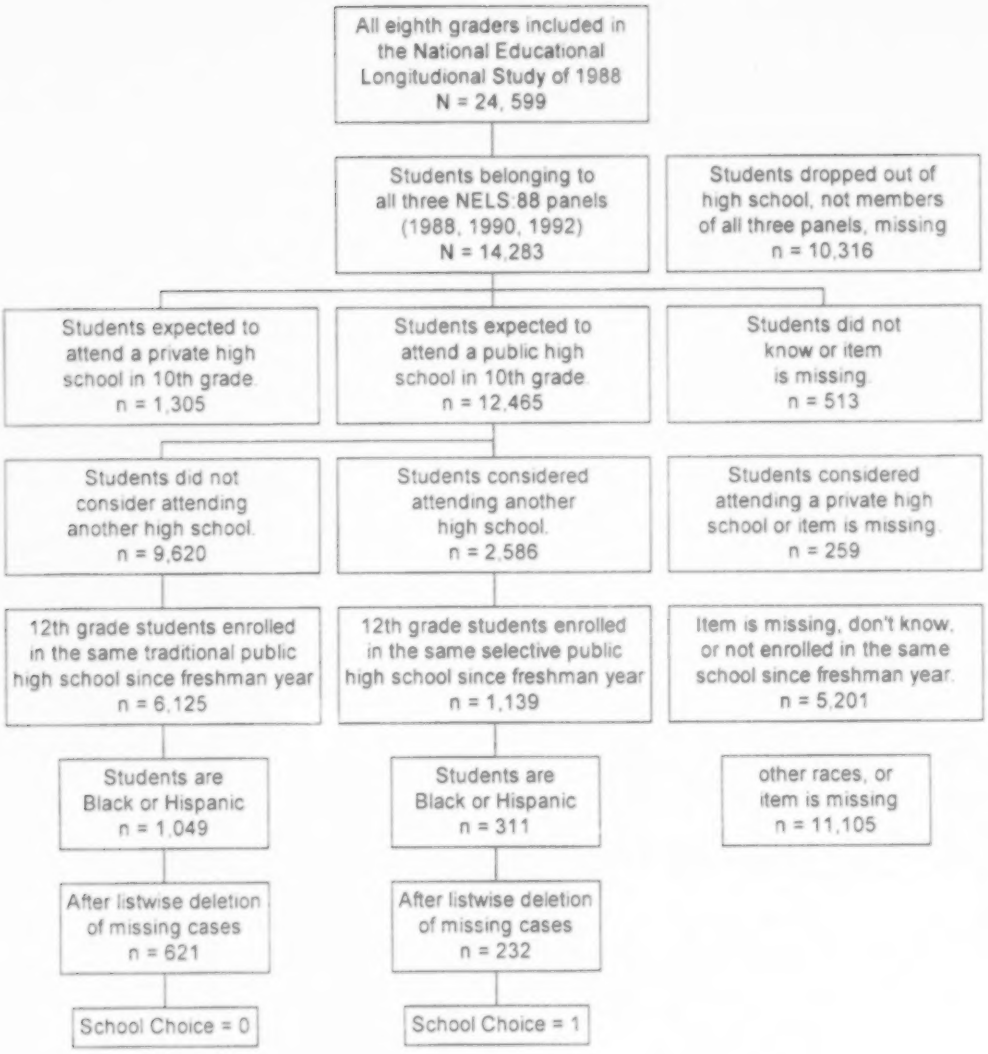

Figure 3. Procedure for extracting the school choice sample from NELS:88.

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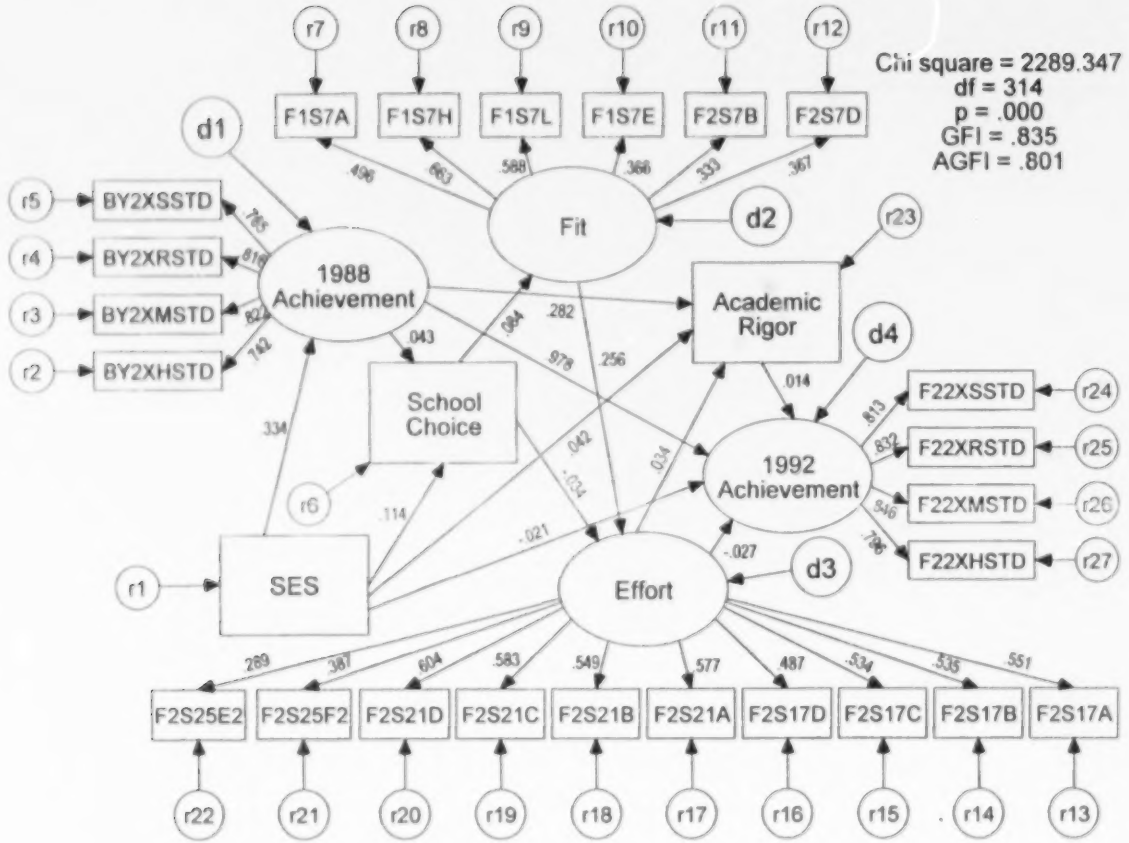

Figure 4. A priori model's results: The indirect effect of public school choice on the academic achievement of Black and Hispanic students.

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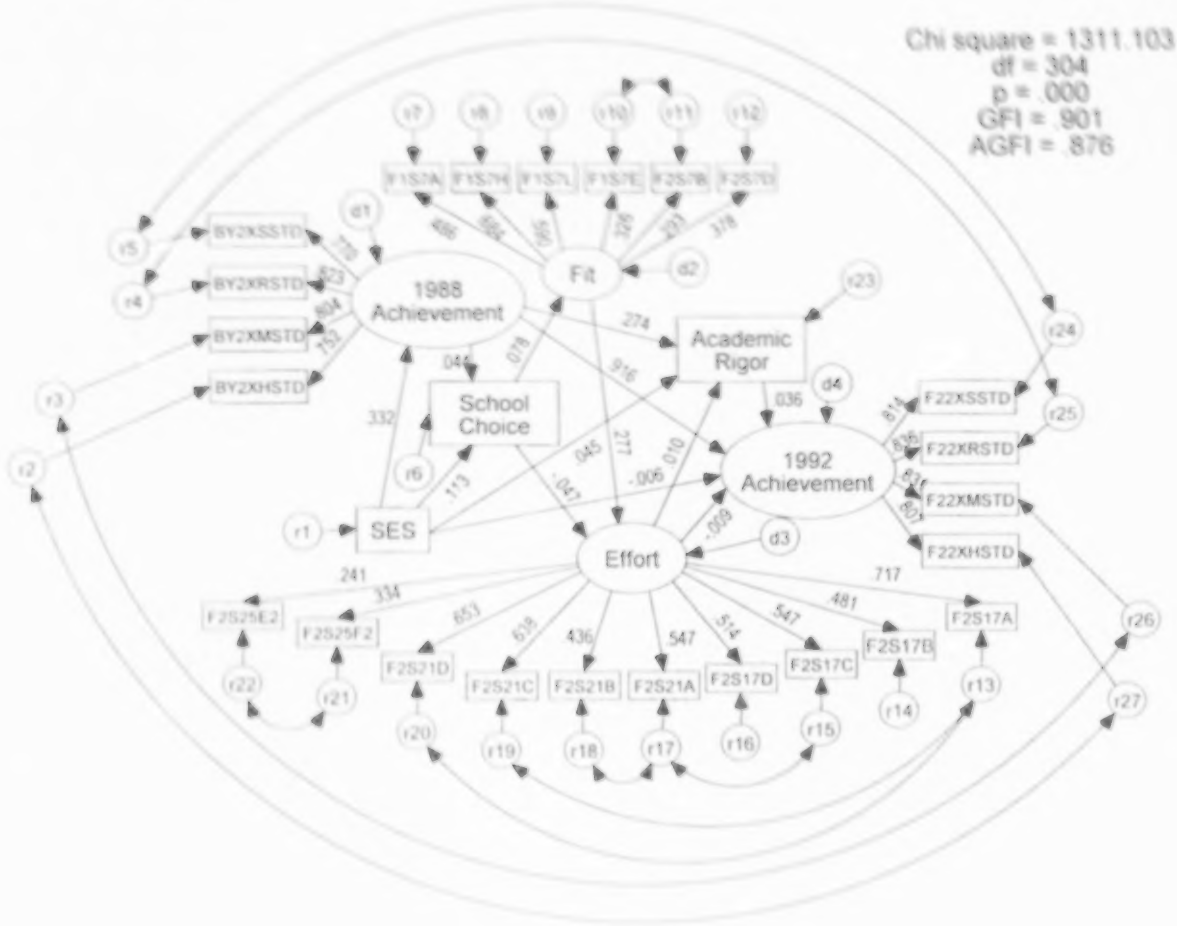

Figure 5. The modified model.

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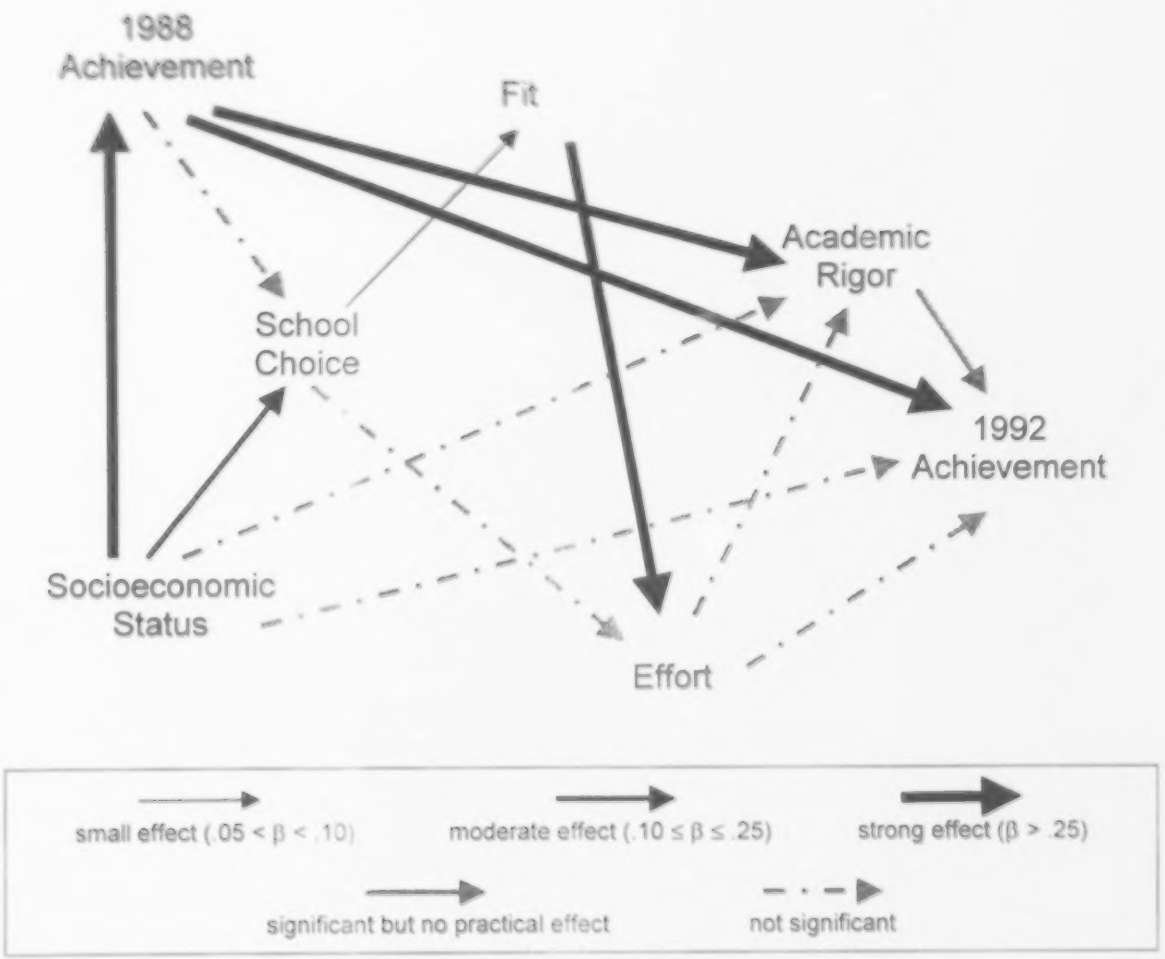

Figure 6. Modified model's relative effect magnitudes.

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